VI. *A Letter from* Stephen Gray, *F. R.* S. *to Dr.* Mortimer, *Secr. R. S. containing ſome* Experiments *relating to* Electricity.

THE following Lines contain an account of what Electrical Experiments I have made ſince thoſe I laſt communicated to the Society which was in *February* laſt.

February the 18th, I tried what Effect would be produced on ſeveral Sorts of Wood with reſpect to the luminous Part of Electricity: the Wood was made into Rods of the ſame Form with thoſe Iron Ones mentioned in my former Letter upon this Subject; the Woods made uſe of were Fir, Aſh and Holly; theſe being ſucceſſively diſpoſed upon Electrick Bodies, after the ſame manner as the Iron Rods had been, the Tube being applied to one End, there appeared a Light on it, but not with ſo great a Force, nor did the Light extend to ſo great a length; neither was the Form of it Conical, but rather Cylindrical; but the Extremity of it ſeemed to conſiſt of a ſhort Fringe of Light; when the Light, that was given to the Rod by the application of the Tube, did ceaſe, upon a motion of my Hand towards the Point of the Rod, the Light came out again, as has been mentioned of the Iron Rods; but when the Hand or Finger was held near the Point of theſe wooden Rods, there was no pricking or puſhing of the Finger felt, as when the Iron Rods were made uſe of I had ſome of theſe Rods made much bigger at one End than the other, and now applying my Finger to

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to the larger End, there not only appeared a Light, but the Finger was puſhed, more eſpecially when the Holly Rod was made uſe of, and the Cheak was a little prick'd, but the Smart was not near ſo great, as when the Iron Rods were uſed; the great End of the Rod was pointed with a much larger Angle then the leſſer one, yet there was very little, if any difference, in the form, or bigneſs of the Light that proceeded from either End.

Having procured me two pair of Lines made of Worſted Yarn, one of them of a Mazareen Blew, the other of a Scarlet Colour; on the 3d of *April*, I ſuſpended the Boy firſt on the Blew Lines, and found that all the Effects were the ſame, as when he was ſuſpended on Lines of Blew Silk. I then ſuſpended him upon the Scarlet Lines, but now though the Tube were as well excited, and the Experiment often repeated, yet there was no Effect produced on him, either of attraction of a pendulous Thread, nor of pricking or burning, by applying one's Hand near him; I then laid one of the Iron Rods firſt upon the Blew Lines, and all the ſame Effects were exhibited, as when the ſame Rod had been laid on Silk Lines of that Colour; but upon laying the ſame Rod upon the Scarlet Lines, no manner of attraction, *&c.* was perceived.

In the Philoſophical Tranſactions, *Numb.* 422. I gave an Account of the Experiments I made upon the communicative Electricity of Water, and that Water is attracted by the Tube, together with ſeveral remarkable Circumſtances with which this attraction is attended; but I have now found, that when the Stand with thoſe little Ivory Cups there mentioned, be ſet upon any Electrick Body, the ſame Phænomena are produced, not only by holding the Tube near the Water, but when that is removed, and the Tip of the Finger placed over the Water, *viz.* there is a little Hill, or Protuberance of Water of a Conical Form, from the Vertex of which proceeded a Light and a ſmall Snapping.

May the 6th, we made the following Experiment. The Boy being ſuſpended on the Silk Lines, and the Tube being applied near his Feet as uſual; upon his holding the End of his Finger near a Gentleman's Hand, that ſtood on a Cake made of Shell Lack and black Roſin; at the ſame time another Gentleman ſtood at the other ſide of the Boy with the pendulous Thread; then the Boy was bid to hold his Finger near the firſt Gentleman's Hand, upon which it was prick'd, and the ſnapping Noiſe was heard; and at the ſame time, the Thread which was by its attraction going towards the Boy fell back, the Boy having loſt a great part of his attraction, upon a ſecond moving his Finger to the Gentleman's Hand, the attraction ceaſed: then the Thread being held near that Gentleman, he was found to attract very ſtrongly; but having ſince repeated this Experiment, I find that though the attraction of the Boy is much diminiſhed, yet he does not quite loſe it, till 2, 3, and ſometimes 4 applications of his Finger to the hand of him that ſtands on the Electrick Body, but without touching him. At another time I cauſed three Perſons to ſtand, one of them upon a Cake of Shell Lack, *&c.* the other upon one of Sulphur, the third upon a Cake of Bees-Wax and Roſin; the Perſons all holding Hands, the Boy applying his Finger

Finger near the firſt Man's Hand, they all three became Electrical, as appeared by the attraction of the Thread, when held near to any of them.

POSTSCRIPT.

A Repetition *of ſome of theſe* Experiments, *and an Addition of ſome others made* June *the* 10*th.*

June the 10th in the Morning, I repeated the Experiments with the Wooden Rods, the moſt material Ones of which were made with the Holly Rod: This being laid on the Glaſs Cylinder, and a Fir Board about a Foot Square and three tenths of an Inch thick being placed erect upon a Stand, that was ſet on another Glaſs Cylinder, ſo that the Center of the Board was placed near the Point of the Rod, but not to touch it by near half an Inch; then the Tube being held near the great End of the Rod, there iſſued out a Light from the little End of the Rod, which was that next the Board; and, as the Boy told me, it came along with a hiſſing Noiſe, and ſtruck againſt the Board: When he touched the Board, there was a Light; and, at the ſame time, another on the End of the Rod, but he heard no ſnapping nor pricking of his Finger, as when the Braſs Plate and Iron Rod were made uſe of.

Experiments with the Scarlet *and* Blue *Worſted Yarn repeated.*

When the Boy was ſuſpended upon the Scarlet Lines, he attracted the white Thread at a very ſmall Diſtance, but the Attraction ceaſed in about 6 or 7 Seconds of Time. Then the Boy being taken off, an Iron Rod was laid on the Lines, but there was no attraction of the Thread by the Body of the Rod ; but when the Thread was held near either of the pointed Ends of it, there was a ſmall Repulſion of it, and in the Dark a very ſmall Light was ſeen at each End of the Rod.

When the Boy was ſuſpended upon the Blue Lines, he attracted the Thread to him when it was held at leaſt a Foot diſtance from him, and continued his attraction to near 75 Seconds, the Iron Rod continued its attraction not more than 36 Seconds.

Experiments made in the Afternoon upon the Boy when he was ſuſpended upon Silk Lines of ſeveral Colours.

When he was ſuſpended on the Blue Lines, he continued his Attraction 50 Minutes, on the Scarlet Lines 25 Minutes, on the Orange coloured Lines 21 Minutes.

By theſe Experiments we ſee the Efficacy of Electricity upon Bodies ſuſpended upon Lines of the ſame Subſtance, but of different Colours, and alſo that the Attraction continues much longer upon Silk than upon Yarn, and conſequeutly Silk is the propereſt Body we can make uſe of to ſuſpend thoſe Bodies upon, to which we would communicate an Electricity : But of this Subject more when I ſhall reaſſume the Experiments concerning the Influence of Colours upon Electricity; who am,

S I R,

Charter Houſe,
June 12, 1735.

Your's and the Society's moſt
Humble and obedient Servant,

Stephen Gray.